Public Comments
LNG Forum
April 2, 2005

The informational and document sources referenced below are based on some of the most recent LNG transportation and storage studies. The assessments and conclusions provided below reflect the viewpoints of these sources only and do not represent City staff positions.

SAFETY ISSUES

Q - How safe is LNG storage? How are spills/leaks controlled?
A - At the City's April 2, 2005 LNG Workshop, the following viewpoints on LNG safety were provided by the panelists:

Bill Kelly (journalist) considered the likelihood of an LNG accident to be slim.

Mike Hightower from SANDIA Laboratories *stated* that the consequences from accidental LNG spills using current safety and security practices are generally low. Mr. Hightower based his assertion on a December 2004 publication from SANDIA entitled "Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water." This publication is available at the U.S. Department of Energy website: www.energy.gov. The SANDIA website is www.sandia.gov. As stated on page 19 of this study, "Beyond approximately 750 meters for small accidental spills and 1,600 meters for large spills, the impacts on public safety should generally be low for most potential spills. Hazards will vary; but minor injuries and minor property damage are most likely at these distances. Increased injuries and property damage would be possible if vapor dispersion occurred and a vapor cloud was not ignited until after reaching this distance." This study further states on page 21 that "(t)he most significant impacts to public safety and property exist within approximately 500 meters of a spill, with much lower impacts at distances beyond 1,600 meters, even for very large spills."

Richard Steinke, Executive Director of Long Beach Harbor Department, stated that the Harbor Department has not taken a position on the proposed LNG plant and is waiting for completion of the joint EIR/EIS environmental document (now expected to be circulated for public review in the fall of 2005) and Hazard Analysis before determining the appropriateness of granting a lease to the LNG facility.

Tom Giles, representing the project applicant Sound Energy Solutions (SES), stated that all LNG tanker vessels are double-hulled, insulated to prevent leakage or rupture, and have an emergency shut-down system in the case of any accident. The storage tanks, constructed of double-walled steel and reinforced concrete, include an outer reservoir wall completely surrounding the storage tank. This reservoir area would be designed to fully contain a greater volume of LNG than the storage tank capacity.

Bry Myown (Long Beach resident) noted that one LNG tanker has the equivalent of 55 Hiroshima bombs. She stressed the importance of evaluating LNG safety in the full context of potentially hazardous factors at this location: Long Beach is a military/terrorist target due to the Port and oil production and Terminal Island is a landfill on a former flood zone area with fault lines and is also both a liquefaction area and subsidence area. Due to this over-concentration of hazards, SANDIA should study the combined Port hazards that could be impacted by a single event.

At an April 22, 2005 meeting of the City Council's Federal Legislation & Environmental Affairs Committee, Long Beach Deputy Police Chief Tim Jackson observed that unless the probability of an accident occurring is zero, then there is some likelihood somewhere that something could happen.

Historically, there have been only three fatal accidents at LNG facilities in this country. In 1944, a storage tank in Cleveland, Ohio spilled LNG into the sewer which resulted in an underground explosion killing 128 people. In 1973, a fire that started during interior repair of a Staten Island, New York storage tank killed 37 construction workers inside the tank. In 1979, a valve leak at a Cove Point, Maryland LNG facility caused an explosion that killed one plant employee.

The following comes from Liquefied Natural Gas (LNG) Infrastructure Security: Background and Issues for Congress, Congressional Research Service (CRS) Report for Congress, Order Code RL32073, September 9, 2003:

"The risks associated with LNG infrastructure in the United States have been debated for decades. … While [the 1944 Cleveland] accident continues to serve as a reminder of the hazards of LNG, technology improvements since the 1940's have made LNG facilities much safer. Serious risks remain, however, since LNG is inherently volatile and is usually stored in large quantities. Because LNG infrastructure is highly visible and easily identified, it is vulnerable to terrorist attack." (page CRS-8)

"Physical Hazards of LNG

"Natural gas is combustible, so an uncontrolled release of LNG poses a serious hazard of explosion or fire. LNG also poses hazards because it is so cold.

Experts have identified several potentially catastrophic events that could arise from an LNG release. The likelihood and severity of these events has been the subject of considerable research and testing. While open questions remain about the impacts of specific hazards in an actual accident, there appears to be consensus as to what are the greatest LNG hazards.

"**Pool fires.** If LNG spills near an ignition source, the evaporating gas in a combustible gas-air concentration will burn above the LNG pool. The resulting "pool fire" would spread as the LNG pool expanded away from its source and continued evaporating. Such pool fires are intense, burning far more hotly and rapidly than oil or gasoline fires. They cannot be extinguished - all the LNG must be consumed before they go out. Because LNG pool fires are so hot, their thermal radiation may injure people and damage property a considerable distance form the fire itself. Many experts agree that a pool fire, especially on water due to thermal effects, is the most serious LNG hazard.

"**Flammable vapor clouds.** If LNG spills but does not immediately ignite, the evaporating natural gas will form a vapor cloud that may drift some distance from the spill site. If the cloud subsequently encounters an ignition source, those portions of the cloud with a combustible gas-air concentration will burn. Because only a fraction of such a cloud would have a combustible gas-air concentration, the cloud would not likely explode all at once, but the fire could still cause considerable damage. An LNG vapor cloud fire would gradually burn its way back to the LNG spill where the vapors originated and would continue to burn as a pool fire. If an LNG tank failed due to a collision or terror attack, experts believe the failure event itself would likely ignite the LNG pool before a large vapor cloud could form. Consequently, they conclude that large vapor cloud fires are less likely than instantaneous pool fires.

"**Flameless explosion.** If LNG spills on water, it could theoretically heat up and regasify almost instantly in a "flameless explosion" (also called a "rapid phase transition"). While the effects of tanker-scale spills have not been studied extensively, Shell Corporation experiments with smaller LNG spills in 1980 did not cause flameless explosions. Based on a review of these experiments, a U.S. national laboratory concluded that "transitions caused by mixing of LNG and water are not violent." Even if there were a flameless explosion of LNG, experts believe the hazard zones around such an event "would not be as large as either vapor cloud or pool fire hazard zones."

"In addition to these catastrophic hazards, an LNG spill poses hazards on a smaller scale. An LNG vapor cloud is not toxic, but could cause asphyxiation by displacing breathable air. Such clouds rise in air as they warm, however, diminishing the threat to people on the ground. Alternatively, extremely cold LNG could injure people or damage equipment through direct contact. The extent of such contact would likely be limited, however, as a major spill would likely result in a more serious fire. The environmental damage associated with an LNG spill

would be confined to fire and freezing impacts near the spill since LNG dissipates completely and leaves no residue (as crude oil does)." (pages CRS 8-9)

"Safety Record of LNG

"The LNG industry has had an impressive safety record over the last 40 years. Since international commercial LNG shipping began in 1959, for example, tankers have carried over 33,000 LNG shipments without a serious accident at sea or in port. Insurance records and industry sources show that there were approximately 30 LNG tanker safety incidents (e.g. leaks, groundings or collisions) through 2002. Of these incidents, 12 involved small LNG spills which caused some freezing damage but did not ignite. Two incidents caused small vapor vent fires which were quickly extinguished.

"The favorable safety record of LNG tankers is largely due to their double-hulled design. LNG carriers are less prone to accidental spills than typical crude oil, fuel, and chemical tankers because they are inherently more robust. LNG tankers also carry radar and global positioning systems alerting operators to traffic hazards. Automatic distress systems and beacons send out signals if a tanker is in trouble. Cargo safety systems include instruments that can shut operations if they deviate from normal parameters. LNG tankers also have gas and fire detection systems.

"Land based LNG facilities also have had a favorable safety record in recent decades. There are approximately 40 LNG marine terminals and more than 150 peak-shaving plants worldwide. Since the 1944 Cleveland fire, there have been 10 serious accidents at these [worldwide] facilities directly related to LNG. Two of these accidents caused fatalities of facility workers – one death at Arzew, Algeria in 1977, and another death at Cove Point, Maryland in 1979. Another three accidents at worldwide LNG plants caused fatalities, but these were construction or maintenance accidents in which LNG was not present. According to one marine terminal operator, exhaustive tests have shown that safety dikes would contain the LNG from a ruptured storage tank, and would limit the effects of any fire to the terminal grounds." (pages CRS 9-10)

The following comes from Liquefied Natural Gas (LNG) Import Terminals: Siting, Safety and Regulation, Congressional Research Service (CRS) Report for Congress, Order Code RL32205, January 28, 2004:

"The recent [January 2004] LNG terminal fire in Algeria demonstrates that, despite technological improvements since the 1940s, LNG facilities can still experience serious accidents. Many lawmakers and the general public are concerned about these hazards. The U.S. LNG industry is subject to more extensive siting and safety regulation than many other similarly hazardous facilities. Federal, state and local governments have also put in place security measures intended to safeguard LNG against newly perceived terrorist threats.

Some community groups and other stakeholders fear that federal siting requirements for LNG facilities are still not stringent enough, but the responsible federal agencies disagree." (pages CRS 23-24)

The following comes from LNG Safety and Security, University of Houston Law Center, Institute for Energy, Law & Enterprise, October 2003, page 32

"All LNG facilities are designed to comply with spill containment [meaning the safe storage and isolation of LNG] requirements. They have extensive safety systems to detect LNG releases using a number of gas detectors (for methane), ultraviolet or infrared fire detectors, smoke or combustion product detectors, low temperature detectors and detectors to monitor LNG levels and vapor pressures. Closed-circuit television systems monitor all critical locations of LNG facilities. Emergency shut down systems can be activated upon detection of leaks, spills, or gas vapors. While there are different types of designs for LNG facilities, health, safety and environmental (HSE) considerations are generally similar. Various codes and standards … ensure that the chances of a release are minimal, as is its volume if a release occurs."

The following comes Liquefied Natural Gas in California: History, Risks, and Siting, California Energy Commission, July 2003.

"LNG is normally held on land in one or more specially designed storage tanks while it awaits regasification. The failure of one or more tanks could release an enormous volume of LNG (e.g., 100,000 cubic meters) with potentially disastrous consequences due to the size of the resulting vapor could. However, the design of modern storage facilities has improved from earlier designs.

"The following three types of LNG storage tanks are used today:

- Single-containment tanks are double-walled. An interior tank is made of nine percent nickel, while the outer tank is made of carbon steel.
- Double-containment tanks have primary and secondary tanks. The secondary tank, typically a concrete wall, is located usually six meters or less from the primary tank. In the event of a leak, the secondary tank contains the cryogenic liquid and limits the surface area and vaporization of an LNG liquid pool.
- Full-containment tanks have a nine percent nickel inner tank, plus a pre-stressed concrete outer tank. The outer tank, which includes a reinforced concrete roof lined with carbon steel, can be designed to withstand realistic impacts from missiles or flying objects.

"Modern storage tanks have no side or bottom penetrations. All penetrations, including those for LNG sendout, are through the roof. This design substantially reduces the amount of LNG spilled in the unlikely event of a rupture or leakage in the sendout piping.

"If LNG stratifies into layers of different densities within a storage tank, a phenomenon called "rollover" could occur. With "rollover," pressures within the tank could rise to excessive levels, and, without properly operating safety-vent valves, pressures could rise to levels that would cause structural damage. To detect the development of "rollover" conditions, modern LNG storage tanks contain instruments to monitor the pressure, temperature, and density of the LNG along the entire height of the liquid column. Furthermore, tank designers provide for LNG recirculation.

"In-tank cameras enable plant operators to assess tank damage in the event of an earthquake and to visually inspect the tank contents in the event of unusual instrument readouts.

"Fire detection and response systems are in place wherever combustible gas is stored or handled. Facility operators use low temperature gas, fire, and smoke detectors, supplemented by closed-circuit television cameras that can identify potentially hazardous situations such as LNG spills and leaks.

"On land, LNG spills are contained using a walled and bermed system that drains all LNG into a basin constructed of reinforced concrete that is sized to contain a specific design-spill. In addition, LNG storage tank impoundments are designed to contain at least 110 percent of a tank's volume in the event of a sudden, uncontrolled tank failure.

"Impoundments not only limit the spread of an LNG spill, they reduce the surface area of the liquid pool, thereby decreasing and controlling the size of the vapor cloud." (pages 4-5)

"LNG facilities are designed to assure adequate distances between the following parts of the terminal facility

- Two or more LNG storage tanks
- The storage area and the jetty
- The vaporization process area and the other parts of the facility

"In addition, LNG facilities must have exclusion zones – the area surrounding an LNG facility in which an operator legally controls all activities. These zones assure that public activities are structures outside the immediate LNG facility boundary are not at risk in the event of an on-site LNG fire or a release of a flammable vapor cloud." (page 6)

The following comes from International and National Efforts to Address the Safety and Security Risks of Importing Liquefied Natural Gas: A Compendium, prepared for the California Energy Commission in January 2005, Executive Summary, pages ii and iii:

"In the unlikely event of an LNG release from a carrier, its contact with the water (or any warmer substance such as air) would cause the LNG to evaporate very rapidly ("vaporize") returning to its original, gaseous state. As the LNG vaporizes, a vapor cloud resembling ground fog will form under relatively calm atmospheric conditions. The vapor cloud is initially heavier than air since it is so cold, but as the LNG absorbs more heat, it becomes lighter than air, rises, and travels downward.

"LNG vapor clouds are flammable within the portion of the cloud where the concentration of natural gas is between five and 15 percent (by volume) mixture with air. To ignite, however, this portion of the vapor cloud must encounter an ignition source. Otherwise, the LNG vapor cloud will simply dissipate into the atmosphere. Close proximity to an ignited LNG vapor cloud could be very dangerous, because of its tremendous radiant hear output. Ignited clouds, however, do not explode in the open atmosphere.

"Preventing spills and responding immediately to spills should they occur are major factors in the design, construction, and operation of LNG carriers and import terminals. Ocean-going carriers are equipped with LNG-cargo tanks housed inside a double-walled hull. LNG tankers are equipped with specialized systems for handling the very low-temperate gas and for combating potential hazards associated with liquid spills and fire. The ship's safety systems are divided into ship handling and cargo system handling. The ship-handling safety features include sophisticated radar and positioning systems that alert the crew to other traffic and hazards around the ship. Also, distress systems and beacons automatically send out signals if the ship is in difficulty. The cargo-system safety features include an extensive instrumentation package that safely shuts down the system if it starts to operate out of predetermined parameters. Ships are also equipped with gas- and fire-detection systems. Such design features have helped to ensure that no major spill, breach, or loss of life has resulted from a shipping accident involving an LNG carrier after 40 years of shipping. LNG berths and jetties have built-in safety features to prevent releases of LNG during ship-to-shore transfers.

"A shore-based LNG terminal consists of a docking facility, LNG-storage tanks, LNG-vaporization equipment, and vapor-handling systems. A ship-to-shore emergency shutdown (ESD) system and associated shut-off valves allow rapid and safe shutdown of an LNG transfer. The ESD system will stop the ship's unloading pumps and close flow valves both on the ship and shore usually within 20 to 30 seconds, thereby limiting any potential release to a few hundred gallons of LNG. Quick-release couplings automatically disconnect the unloading arms during emergencies.

"LNG is normally held on land in one or more specially designed storage tanks while it awaits regasification. The failure of one or more tanks could release an

enormous volume of LNG (e.g., 100,000 cubic meters) with potentially disastrous consequences due to the size of the resulting vapor cloud. However, the design of modern storage facilities has improved from earlier designs. Modern storage tanks have no side or bottom penetrations. All penetrations, including those for LNG sendout, are through the roof. This design substantially reduces the amount of LNG spilled in the unlikely event of a rupture or leakage in the sendout piping."

Det Norske Veritas (DNV), an independent technical organization that seeks to mitigate the risk and improve the quality, safety, and environmental performance of the LNG industry, concluded in a June 2004 report entitled Consequences of LNG Marine Incidents (page 18) that "(t)he historical record of LNG shipping suggests that a large scale release is unlikely to occur in the foreseeable future of the LNG trade in the US."

Q - Who pays for security costs to protect LNG facility?
A - At an April 22, 2005 meeting of the City Council's Federal Legislation & Environmental Affairs Committee, officials from the Long Beach Police Department reported their observations from a recent visit to a Boston Harbor area LNG facility. According to their report, the City of Boston is incurring security and public safety expenses related to this LNG facility that have not been reimbursed by the Federal government of the facility operator. The City of Long Beach is now making efforts to insure that should any LNG facility be locally established, the City would be fully reimbursed by the Federal government and/or the facility operator for all security-related expenses.

Q - How attractive would this LNG facility be as a terrorist target? Would Camp Pendleton be more secure if a safe distance from the San Onofre nuclear power plant?
A - The following discussion comes from the California Energy Commission website (www.energy.ca.gov):

"To address terrorist risk, the Ship and Port Facility Security Code was adopted in 2003 by the member countries of the International Maritime Organization (IMO), an agency of the United Nations responsible for maritime matters concerning ship safety. This code requires both ships and ports to conduct vulnerability assessments and to develop security plans. To heighten security of LNG facilities at American seaports, Congress passed the U.S. Maritime Transportation Security Act of 2002, which requires all ports to have federally-approved security plans. Detailed security assessments of LNG facilities and vessels are also required.

"The Department of Transportation (DOT), Research and Special Programs Administration, issues and enforces federal safety standards for land-based LNG facilities, although the Federal Energy Regulatory Commission (FERC) can impose more stringent safety requirements that DOT's when warranted. The

U.S. Coast Guard (USCG) issues and enforces regulations for waterfront facilities handling LNG."

The following comes from LNG Facilities in Urban Areas, A Security Risk Management Analysis for Rhode Island Attorney General Patrick Lynch, Good Harbor Consulting LLC, May 2005

"Traditional risk management calculation methodologies are insufficient to deal effectively with the security risk now posed by terrorist groups. Traditional risk management methodologies would have determined that the probability of terrorists employing hijacked commercial passenger aircraft to destroy the World Trade Center was zero. The probability of a terrorist attack occurring can not be effectively measured, but it is now "a foreseeable risk" in the United States." (page 3)

"Weapons and other capabilities needed to conduct an attack on an urban LNG off loading facility or an LNG tanker can be readily obtained in the US, according to US Government reports." (page 5)

"While there is no adequate way in which to determine the probability of a terrorist attack on the proposed urban LNG facility and inland waterway transit routing, there is adequate grounds to judge that such an attack would be consistent with terrorists demonstrated intent and capability. There is also a basis to judge that likely enhanced security measures would not significantly reduce the risk. While there are some differences among experts about the conditions needed to generate a catastrophic explosion and about the precise extent of the resulting damage, there is [sic] significant grounds to conclude that a high risk exists of catastrophic damage from the types of attacks terrorists are capable of mounting. Those damage levels would overwhelm regional trauma, burn, and emergency medical capabilities. The LNG facility's insurance is likely to be inadequate to fully compensate victims and to rebuild facilities.

"Siting the LNG off loading facility in a non-urban setting would reduce the terrorists' incentives to attack it.

"Non-urban locations may possibly increase costs to the LNG operator and consumers.

"If all alternative sites do cost more and governments decide to proceed with the proposed urban location because of that cost differential, then the cost trade off can be precisely measured. Governments would be deciding that avoiding the possible additional financial cost to the LNG operator and/or consumers of a more secure location is more important public policy than avoiding the additional risk of a catastrophic attack involving mass trauma and burn injuries which does accompany a decision to permit an urban LNG facility." (pages 9-10).

The following discussion comes from International and National Efforts to Address the Safety and Security Risks of Importing Liquefied Natural Gas: A Compendium, prepared for the California Energy Commission in January 2005:

"Perhaps the largest uncertainty regarding LNG safety is the threat of piracy or terrorism. These activities have not been considered as thoroughly in risk assessments as have accidents or natural causes." (page 29)

"While the potential exists for an entire vessel to be used as a weapon in a terrorist strike, previous terrorist incidents involving ships have tended to target vessels rather than use them as weapons. Terrorist attacks against maritime targets are relatively rare, in part because most terrorists have little maritime experience (operating at sea requires special equipment and skills) and the many land targets offer higher visibility and greater ease of access." (page 30)

"New maritime security regulations and the general lack of marine experience among terrorists may reduce the potential for a terrorist attack on an U.S. LNG import terminal. In the unlikely event that a missile or another vessel hit an LNG carrier, the conservative modeling conducted by Lloyd's Register and [Det Norske Veritas] DNV suggest that exposure to harmful thermal radiation would be limited to distances near the carrier. The force required to penetrate the carrier's four liquid-tight barriers would likely ignite the LNG vapor cloud quickly." (pages 44-45)

"The new [International Maritime Organization] IMO and [Maritime Transportation Security Act of 2002] MTSA regulations significantly increase port and tanker security measures, with the [United States Coast Guard] USCG taking a major lead in promoting a safe environment for LNG facilities. Many of the new maritime security regulations focus on the developing security and other plans. Implementation, training, and auditing of these plans will be critical to ensuring the continued operating safety of these facilities." (page 45)

"New terminals typically specify full-containment storage tanks, which have a nine-percent nickel inner tank, plus a pre-stressed concrete outer tank. The outer tank, which includes a reinforced concrete roof lined with carbon steel, can be designed to withstand realistic impacts from missiles or flying objects." (Executive Summary, page iii)

The following comes from Liquefied Natural Gas (LNG) Infrastructure Security: Background and Issues for Congress, Congressional Research Service (CRS) Report for Congress, Order Code RL32073, September 9, 2003:

"No LNG tanker or land-based LNG facility has been attacked by terrorists." (page CRS-11)

"The potential hazard from terror attacks on LNG tankers continues to be debated among experts. One recent study of tankers serving the Everett LNG terminal [Major Disaster Planning: Understanding and Managing Your Risk, Lloyd's Register, March 4, 2002] assessed the impact of 1) a hand-held missile attack on the external hull, and 2) a bomb attack from a small boat next to the hull (similar to the Limberg [2002 oil supertanker attack in Yemen] attack). The study found that "loss of containment may occur through shock mechanisms caused by small amounts of explosive." The study concluded that "a deliberate attack on an LNG carrier can result in a … threat to both the ship, its crew and members of the public." However, the study also found the risk of a public catastrophe to be small. For example, the study found that the LNG pool hazard would be less than that for a gasoline or liquefied petroleum gas (LPG) pool. The study also concluded that a vaporized LNG explosion would be unlikely because a missile or bomb presents multiple ignition sources. Other experts have calculated that an LNG fire under "worse case" conditions could be much more hazardous to waterfront facilities. Impact estimates for LNG tanker attacks are largely based on engineering models, however, each with its own input assumptions – so it is difficult to assert definitively how dangerous a real attack would be." (pages CRS-11 and 12)

Q - What are the procedures for fire suppression for LNG fires? How far and how fast would such fires travel?
A - The following comes from LNG Facilities in Urban Areas, A Security Risk Management Analysis for Rhode Island Attorney General Patrick Lynch, Good Harbor Consulting LLC, May 2005

"… according to the studies done on the characteristics of a LNG fire, the initial damage to property and injuries to people would occur within 30 seconds of ignition, at distances as much as a half-mile from the site of the spill. The damage would be done so quickly that the efficacy of evacuation procedures would be significantly curtailed. The steps recommended by {Federal Energy Regulatory Commission} FERC to be incorporated into the emergency response plan will be of little use in the event of a large-scale release and ignition of LNG. Designated contact people in the various emergency response devices are standard elements of emergency response scenarios, and are useful in the event of a building fire or a natural disaster, but would be rendered useless during a major LNG fire." (page 56)

The following comes from Liquefied Natural Gas in California: History, Risks, and Siting, California Energy Commission, July 2003, pages 5-6.

"When detector readings activate an alarm in the LNG operations control room, some fire-suppression responses are automatic. For example, high-expansion foam generators produce and deliver foam automatically to a spill or leak area. Initially, the foam helps to disperse LNG vapors upwards and away from potential

ignition sources. Since potential sources of ignition are more likely found close to ground level, the upward dispersion substantially reduces the chances ignition.

"In addition, if a "pool fire" develops at an LNG facility, foam provides some control over the rate of burning. Essentially, the foam blankets the liquid surface to limit heat transfer from the air to the liquid, thereby reducing the rate of vaporization. Consequently, the rate of burn is limited since only the vapor will burn after it mixes with adequate oxygen. Foam will be applied repeatedly until all LNG has been burned in a controlled manner.

"Water is ineffective in fighting LNG fires because it provides a heat source for vaporization. Instead, firefighters apply dry powder (e.g., sodium bicarbonate or potassium bicarbonate) to extinguish LNG fires in the open air. However, water sprinklers are used to cool building surfaces and protect fire-fighting and other equipment from thermal-radiation damage. Fireproofing of structures and equipment are additional mandatory safety features within LNG facilities."

The following comes from LNG Safety and Security, University of Houston Law Center, Institute for Energy, Law & Enterprise, October 2003:

"Fire detection sensors at LNG facilities would sound an alarm and immediately begin a shutdown procedure. Foam, dry chemical and/or water would be dispersed immediately from automated firefighting systems. If there is an ignition source, then a pool fire would develop at the liquid LNG release point. LNG vapor burns with very little smoke. The LNG quickly evaporates due to the heat of the surroundings and the flame. If a release of LNG goes unignited for a period of time, then a vapor cloud can form. If ignited, a vapor cloud burns back to the source of the release. The speed of burn depends on conditions such as the size of the release and weather conditions." (pages 32-33).

"Fighting an LNG spill fire is very similar to fighting an hydrocarbon fire. Techniques have been refined over the years to cope with LNG as with any other hydrocarbon fire. The Texas A&M fire school and Northeast Gas Association have been training fire fighters and other industry professionals on LNG spill fires for over 25 years. Development of special dry chemical and high expansion foam systems to control LNG fires began with a series of industry sponsored tests and resulted in engineering data that permit the LNG facility designer to configure very reliable LNG fire control systems." (pages 50-51).

Q- In terms of money and jobs generated by this facility, what would be considered the acceptable level of collateral damage in the event of a catastrophic disaster?
A - A catastrophic disaster is not considered to be an acceptable inevitability in exchange for increased local revenue and employment generation.

*G*iven the historically strong safety record of the LNG industry and "the large array of laws, regulations, standards and guidelines currently in place to prevent and lessen the consequences of LNG releases" (quoted from "LNG Safety," California Energy Commission, www.energy.ca.gov/lng/safety), a community could make a decision based on current technological information as to whether a future accident, even if considered an unlikely event, would be an acceptable risk given the potential benefits.

Since the probability of a LNG incident occurring is greater than zero, there would always be some level of risk involved with any LNG facility and a future incident would be a real possibility.

To some the risk is not acceptable. At the April 2, 2005 LNG Workshop, panelist Bry Myown stated that the potential for a major disaster, whether accidental or intentional (war, terrorism), is too great to permit this LNG facility. She cited the combination of both existing oil production facilities and environmental conditions (landfill, seismicity, liquefaction area, subsidence area) as a setting that could contribute to an LNG disaster. A major incident would result in massive damage to both people and property over an area that could include downtown Long Beach as well as residential neighborhoods north of the Port.

In terms of money and jobs generated by this LNG facility, the applicant, SES (Sound Energy Solutions, represented by Tom Giles, Chief Operating Officer) stated at this April 2 Workshop that the project would create approximately 1,000 union jobs during the 36 month construction period. Once operational, this facility is expected to provide 61 full-time jobs, including 28 truck drivers, and will sustain up to 213 indirect jobs. Lois Ledger from the League of Women Voters estimated at this April 2 Workshop that the City of Long Beach would receive over $1.3 million in annual tax revenues from this LNG facility while $2.8 million in annual property tax revenues would go to the local school district and special districts. These estimates (which come from the Los Angeles Economic Development Corporation) have not been verified by the City for accuracy.

SES states in its "Long Beach LNG Terminal Fact Sheet" that the combined state and local government revenues will increase by an estimated $6.1 million annually as a result of the new LNG terminal's operations, with over $4 million injected directly into Long Beach itself.

Q - What would be the role of the Long Beach Police in clearing this area during an emergency?
A - The Port, in cooperation with the Long Beach Police and Fire Departments, would provide personnel and equipment for emergency response actions. The facility operator, SES, would also assist in evacuation and containment procedures. The level of local police and fire assistance have not been fully determined at present but will be addressed in the joint EIR/EIS prepared by the Port and Federal Energy Regulatory Commission (FERC). This environmental

review document is anticipated to be available for public review in the fall of 2005. According to testimony by Long Beach Fire Chief David Ellis at an April 22, 2005 meeting of the City Council's Federal Legislation and Environmental Affairs Committee, the City resources required to mitigate any potential emergency would heavily impact staffing in the Fire, Police and other City departments, creating a major fiscal impact to the City.

Q -Why is it considered necessary to shutdown movements of all other ships in harbor when LNG containers arrive? What are the costs of this shutdown to the Port and to individual shippers and truckers?
A - Precautions are taken for public safety and security reasons. The Boston Harbor LNG facility provides the only comparable procedures for an urban harbor LNG facility on the U.S. mainland. Based on the findings of an April 11-12, 2005 visit to this harbor by Long Beach Fire Department Chief David Ellis and Long Beach Police Department Deputy Chief Tim Jackson, entrance into Boston Harbor by an LNG vessel requires establishment of a security zone when an LNG vessel enters the harbor and no maritime traffic is allowed within this security zone. The Coast Guard maintains command and control from one of their boats and two boats each from the Massachusetts State Police, Boston Police Department and the Massachusetts Environmental Police meet the LNG vessel.

This security zone is essentially a moving flotilla that delays the movement of other commercial shipping vessels. The costs to individual shipping operations are dependent on the duration of the delay and the cost per hour of delay. Tom Giles of SES estimated it will take one and a half hours for Port entry and another one and a half hours to leave the Port for each LNG vessel.

This issue will be discussed in the greater detail in the EIR/EIS, expected to be available for public review in the fall of 2005.

Q - Will the Port be shut down every time an LNG tanker comes in? To what degree would other harbor traffic be impacted by LNG tankers being docked at Port?
A - While Port operations would not be shut down entirely, a security zone similar to the Boston Harbor operations would be in place, thus delaying the movement of other commercial shipping vessels. The Coast Guard will board all LNG vessels outside of the breakwater area. A security zone will be maintained around all LNG vessels throughout the entire Port entry and exit. The Port is a one-way channel, so no vessels moving in opposite directions can pass each other.

Q - Where would the degasified methane be stored?
A - LNG storage will be in state-of-the-art design containers, which will be built on pilings to ensure stability. These pilings will be 200 feet under these storage

tanks to withstand seismic events. All design specifications for these storage tanks will be consistent with current industry safety and security standards.

Q - What are the possible long term health effects from an explosion at this LNG facility? What has been the health impacts of past LNG explosions (i.e., Algeria, Belgium)?

A - Potential health hazards are limited to the short term effects of a fire or explosion. Compared to common fuels such as gasoline or propane, LNG vapors dissipate more easily, meaning that potential hazards from these other fuels would last longer than for LNG. If LNG is released into the atmosphere, the resulting vapors (methane) will warm, become lighter than air, and disperse with the prevailing wind. LNG vapors do not catch fire as easily as gasoline or propane.

The following comes from LNG Safety and Security, University of Houston Law Center, Institute for Energy, Law & Enterprise, October 2003, page 54 ("Is LNG environmentally friendly?"):

"When LNG is vaporized and used as fuel, it reduces particle emissions to near zero and carbon dioxide (CO2) emissions by 70 percent in comparison with heavier hydrocarbon fuels. When burned for power generation, the results are even more dramatic. Sulfur dioxide (SO2) emissions are virtually eliminated and CO2 emissions are reduced significantly. If spilled on water or land, LNG will not mix with the water or soil, but evaporates and dissipates into the air leaving no residue. It does not dissociate or react as does other hydrocarbon gases and is not considered an emission source. Additionally there are significant benefits when natural gas is used a fuel over other fossil fuels. However, methane, a primary component of LNG, is considered to be a greenhouse gas and may add to the global climate change problem if released into the atmosphere."

At the April 2, 2005 LNG Workshop, Bill Powers stated that this LNG facility would probably result in slightly poorer air quality due to nitrogen oxide and particulate matter emissions from LNG tanker storage. The SES representative, Tom Giles, stated there would be no net emissions and this facility would be the cleanest in the Port.

In regard to the health impacts of past LNG explosions in countries such as Algeria and Belgium, no information on the possible long-term impacts of these incidents are available to staff at present. As noted by Lois Ledger (League of Women Voters) at the April 2, 2005 LNG Workshop, Algerian LNG safety standards are not the same as LNG safety standards in this country. However, some members of the public who attended the April 2 Workshop felt the long range health effects of LNG transportation and storage have been understated by industry proponents.

Q - Has the Union Carbide disaster in Bhopal, India been examined for similarities in this proposed LNG facility?
A - Staff has no available information at present on comparisons to the Bhopal, India facility to this proposed LNG facility.

Safety standards in this country are generally more stringent than in other countries. This proposed LNG facility would be in compliance with all U.S. safety and security standards, which will be discussed in the forthcoming EIR/EIS for this project.

Q - Can the heat from an LNG pool fire start fires at refineries and other plants 2-4 miles away from LNG site?
A - This is not considered likely to occur. LNG vapor (mainly methane) burns only within the narrow range of 5 percent to 15 percent gas-to-air mixture. For LNG to burn, it must be released, vaporize, mix with air within this flammable ratio, and then be exposed to an ignition source. Since an LNG fire would burn with intense heat, firefighting and other safety equipment will be installed at this location. Fighting an LNG spill fire is very similar to fighting any hydrocarbon fire. Special dry chemicals and high expansion foam systems to control LNG are considered very reliable in controlling LNG fires. Therefore, containment and suppression of an LNG fire would be similar to any other type of natural gas fire.

The following comes from Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water, Sandia National Laboratories, December 2004

"The pool sizes for the credible spills estimated could range from generally 150 meters in diameter for a small, accidental spill to several hundred meters for a large, intentional spill. Therefore, high thermal hazards from a fire are expected to occur within approximately 250-500 meters from the origin of the spill, depending on the size of the spill. Major injuries and significant structural damage are possible in this zone. The extent of the hazards will depend on the spill size and dispersion from wind, waves, and currents. People, major commercial/industrial areas or other critical infrastructure elements, such as chemical plants, refineries, bridges or tunnels, or national icons located within portions of this zone could be seriously affected.

"Hazards and thermal impacts transition to lower levels with increasing distance form the origin of the spill. Some potential for injuries and property damage can still occur in portions of this zone; but this will vary based on spill size, distance from the spill, and site-specific conditions. For small spills, the hazards transition quickly to lower hazard levels.

"Beyond approximately 750 meters for small accidental spills and 1,600 meters for large spills, the impacts on public safety should generally be low for most potential spills. Hazards will vary; but minor injuries and minor property damage

are most likely at these distances. Increased injuries and property damage would be possible if vapor dispersion occurred and a vapor cloud was not ignited until after reaching this distance." (page 19)

"The most significant impacts to public safety and property exist within approximately 500 meters of a spill, with much lower impacts at distances beyond 1,600 meters, even for very large spills." (page 21)

"Key Conclusions: Safety Analysis and Risk Management

"Risks from accidental LNG spills, such as from collisions and groundings, are small and manageable with current safety policies and practices." (page 76)

"Risks from intentional events, such as terrorist acts, can be significantly reduced with appropriate security, planning, prevention, and mitigation." (page 77).

"Large, unignited LNG vapor releases are unlikely. If they do not ignite, vapor clouds could spread over distances greater than 1,600 meters from a spill. For nominal accidental spills, the resulting hazards ranges could extend up to 1,700 meters. For a nominal intentional spill, the hazard range could extend to 2,500 meters. The actual hazard distances will depend on breach and spill size, site-specific conditions, and environmental conditions." (page 77)

Exhaustive tests have shown that safety dikes would contain the LNG from a ruptured storage tank, and would limit the effects of any fire to the terminal grounds (Liquefied Natural Gas (LNG) Infrastructure Security: Background and Issues for Congress, Congressional Research Service (CRS) Report for Congress, Order Code RL32073, September 9, 2003):
"

The following comes Liquefied Natural Gas in California: History, Risks, and Siting, California Energy Commission, July 2003, pages 5-6.

"When detector readings activate an alarm in the LNG operations control room, some fire-suppression responses are automatic. For example, high-expansion foam generators produce and deliver foam automatically to a spill or leak area. Initially, the foam helps to disperse LNG vapors upwards and away from potential ignition sources. Since potential sources of ignition are more likely found close to ground level, the upward dispersion substantially reduces the chances ignition.

"In addition, if a "pool fire" develops at an LNG facility, foam provides some control over the rate of burning. Essentially, the foam blankets the liquid surface to limit heat transfer from the air to the liquid, thereby reducing the rate of vaporization. Consequently, the rate of burn is limited since only the vapor will burn after it mixes with adequate oxygen. Foam will be applied repeatedly until all LNG has been burned in a controlled manner.

Q - How can you assure us you could prevent a catastrophe in the event of an earthquake? What are the chances of a disaster such as in Algeria happening to Long Beach?
A - According to the project applicant (Tom Giles, SES) at the April 2, 2005 LNG Workshop, the LNG storage facility will be constructed on pilings built 200 feet below surface to provide protection against seismic events. This safety issue will be further discussed in the EIR/EIS.

A Fact Sheet provided by the California Energy Commission ("Algerian LNG Plant Explosion") provides background on the January 19, 2004 LNG explosion in Skikada, Algeria. In this incident, a steam boiler that was part of an LNG production plant exploded, triggering a second, more massive vapor-cloud explosion and fire that destroyed a portion of the LNG plant and caused death, injury and damage outside of the plant's boundaries. The explosion was most likely an accident, not sabotage. However, the only components common to both LNG liquefaction plants such as this Algerian facility and this proposed LNG storage terminal would be storage tank facilities supporting LNG carrier loading and unloading. While an LNG leak could occur in a storage terminal, facility design, equipment and operating procedures in accordance with U.S. safety and security regulations would be in place to prevent such an incident from occurring or escalating.

Q - Would this facility be safer if placed underground? Are the underground Tokyo LNG facilities protected from earthquake rupture? What are the differences between the construction specifications of the underground Toyko LNG plant and this proposed project?
A - According to Tom Giles from SES, the Tokyo plant is the only underground LNG facility in Japan and this was not done for safety reasons. Undergrounding LNG facilities has certain safety and security drawbacks, since certain safety inspections cannot be performed underground. However, Bill Powers stated at the April 2, 2005 LNG Workshop that the recent trend in Japan is to underground facilities since it provides for better spill containment than above ground storage tanks.

Q - Under what circumstances would this LNG facility be required to be placed underground?
A - Given the seismic and watertable considerations in this area, undergrounding of storage tanks is not considered to be a viable option. LNG tanks placed underground in Tokyo are due more to land costs and availability than to safety factors. Required safety inspections are also more difficult for underground facilities. This matter will be addressed in the forthcoming EIR/EIS.

Q - In 1970, did the U.S. Congress recommend that all LNG facility locations be limited to under-populated areas only?
A - This question references a 1970 Congressional recommendation not presently available for staff to review and evaluate. .

Q - Why build LNG facility in a highly populated area such as Long Beach?
A - The project applicant (Tom Giles, SES) stated at the April 2, 2005 LNG Workshop that of all the possible locations SES explored along the West Coast, an industrial port was the proper place for this facility and that this proposed facility would be further away from residents than half of the LNG facilities in the world. According to Tom Giles, an off-shore facility was not considered since it could not provide vehicle fuel and would therefore not provide a cleaner source of vehicle fuel.

Q - If LNG tankers are so dangerous that other Port operations must be shut down, wouldn't this increase danger to downtown residents/workers/tourists?
A - The upcoming EIR/EIS will thoroughly discuss and analyze LNG safety issues in the Port and surrounding areas.

Q - Why can't this facility be built in a less populated area to prevent a serious loss of life and property?
A - The project applicant (Tom Giles, SES) stated at the April 2, 2005 LNG Workshop that of all the possible locations SES explored along the West Coast, an industrial port was the proper place for this facility and that this proposed facility. The EIR/EIS will thoroughly discuss and analyze all potential safety issues associated with this proposed LNG facility.

Q - What would be the impact to downtown hotels? Has any consideration been given to potential LNG impacts on their business?
A - The upcoming EIR/EIS will thoroughly discuss and analyze LNG safety issues in the Port and surrounding areas.

Q - How did SANDIA develop their estimates on potential spills or leakages? Did they assume the LNG containment vessel would be breached at the bottom or at the top? Did they consider that LNG methane is lighter than air and will readily dissipate upon vaporization?
A - SANDIA may be contacted via their website at www.sandia.gov. This research will be addressed in the upcoming EIR/EIS.

Q - What about tsunami protection? Wouldn't an off-shore location be better protection against a tsunami?
A - The potential impact of natural hazards on this proposed facility will be analyzed in the EIR/EIS.

Q - Isn't there a greater risk of a destructive LNG explosion with the gas storage tanks in and around the harbor area?
A - Proper application of safety and security measures in accordance with current regulations would be similar to gasoline storage facilities. Analysis of this issue will be included in the upcoming EIR/EIS.

Q - What is the potential of an explosion similar to the Sansenina explosion?
A - Analysis of this issue will be included in the upcoming EIR/EIS.

Q - Would LNG be used in the Wilmington oil field?
A - The LNG will be regasified and shipped via pipeline to South California Gas Company facilities in Wilmington. The safety and security issues involved in this transportation process will be analyzed in the EIR/EIS.

Emergency Response

Q - Who pays for costs of clean-up in event of a spill, explosion or other environmental damage?
A - This is a matter that could be determined as part of the Port's lease negotiation with SES.

On an April 22, 2005 meeting of the City Council's Federal Legislation & Environmental Affairs Committee, officials from the Long Beach Police Department reported their observations from a recent visit to a Boston-area LNG facility. According to their report, the City of Boston is incurring security and public safety expenses related to this LNG facility that have not been reimbursed by the Federal government of the facility operator. The City of Long Beach is now making efforts to insure that should any LNG facility be locally established, the City would be fully reimbursed by the Federal government and/or the facility operator for all security-related expenses.

Q - How much of an assurance or guarantee can the City or SES provide that there would never be an accident or loss of life?
A - The EIR/EIS will provide thorough analysis of the safety and security issues involved with this proposed facility.

Air Quality Issues

Q - What is the AQMD position on LNG versus other fuels such as gasoline?
A - To date, AQMD has not provided staff with a position on LNG in relation to other fuels. AQMD will have an opportunity to review and comment on the EIR/EIS as part of the public circulation process. The AQMD website is www.aqmd.gov. The EIR/EIS is anticipated to be available for public review in the fall of 2005.

Q - How can Long Beach or this region clean the air at the Port without using cleaner fuels such as LNG?

A - At the April 2, 2005 LNG Workshop, Bill Powers stated that this LNG facility would probably result in slightly poorer air quality due to nitrogen oxide and particulate matter emissions from LNG tanker storage. The SES representative, Tom Giles, stated there would be no net emissions and this facility would be the cleanest in the Port.

Natural gas is considered to be the cleanest burning of all nonrenewable energy sources. AQMD will continue to establish rules and regulations intended to improve regional air quality.

Q - What are reasonable alternatives to natural gas in solving the immediate and long term need for cleaner burning fuels? What is the cost for not studying this issue?
A - Several speakers at the April 2 Workshop expressed opposition to fossil fuels for environmental reasons and advocated increased use of alternative energy resources such as solar, wind, electrical or bio-diesel power. Whether these alternative energy sources can fully meet existing or future demand is a subject open to debate. Short-term energy needs are typically met with existing technologies, while exploring emerging technologies provides an opportunity to better meet future long-term needs.

Q - What will this project do to improve the air quality in Long Beach?
A - Natural gas is considered to be the cleanest burning of all nonrenewable energy sources. Use of natural gas instead of diesel fuel in vehicles would reduce diesel fuel emissions.

At the April 2, 2005 LNG Workshop, Bill Powers stated that this LNG facility would probably result in slightly poorer air quality due to nitrogen oxide and particulate matter emissions from LNG tanker storage. The SES representative, Tom Giles, stated there would be no net emissions and this facility would be the cleanest in the Port.

Q - How does LNG benchmark against existing fuels?
A - In terms of air quality, natural gas is considered to be the cleanest burning of all nonrenewable energy resources.

<u>Other LNG Locations</u>

Q - Are there any off-shore LNG facilities along the Pacific coast?
A - No. According to SES, there are currently no LNG terminals on the West Coast of this country (excluding the Kenai, Alaska shore-based terminal).

Q - How close are residents to other existing LNG facilities in this country?
A - Currently, there are 108 working LNG facilities in this country, including baseload receiving, re-gasification and storage terminals. There are currently only six LNG shore-based receiving terminals in this country, located in Everett

(Boston Harbor) Massachusetts; Lake Charles, Louisiana; Cove Point, Maryland; Elba Island, Georgia; Kenai, Alaska; and Penuelas, Puerto Rico. The Boston Harbor facility is located in the most densely populated area.

Q - Where are the nearest existing LNG facilities to Long Beach?
A - The only LNG storage facility presently in Long Beach is a small storage terminal for City vehicle fuel located in the City of Long Beach Fleet Maintenance Yard at the northeast corner of Willow Street and Temple Avenue.

Q - Doesn't the Boston harbor shutdown whenever an LNG vessel is being berthed and/or unloaded?
A - The Coast Guard maintains a security zone around all LNG tankers and other safety measures are taken, but the harbor is not at a complete shutdown during LNG vessel movements.

JURISDICTIONAL ISSUES

Federal Authority

Q - Does the FERC have eminent domain authority for pipeline rights-of-way?
A - Not presently. The U.S. Senate passed a comprehensive energy policy bill known as the Energy Policy Act of 2005 by a vote of 85 to12 on June 28, 2005. The U.S. House of Representatives passed a similar energy bill on April 21, 2005 by a vote of 249-183. The Senate and House bills will be referred to a Conference Committee in charge of resolving language differences. However, both bills grant the Federal Energy Regulatory Commission (FERC) exclusive jurisdiction over state agencies to authorize the siting, construction, expansion and operation of LNG terminals, but do not grant FERC the power of eminent domain in its siting and regulatory authority.

Q - What is the federal bill number of the FERC legislation seeking sole authority and/or eminent domain authority over this project?
A- The U.S. Senate bill, passed on June 28, 2005, is now known as the Energy Policy Act of 2005. This bill gives the Federal Energy Regulatory Commission (FERC) exclusive authority under Section 3 of the Natural Gas Act over the siting, construction, expansion and operation of LNG import terminals located onshore or in state waters. An attempt by Senator Feinstein to give state regulatory bodies (i.e. California Public Utilities Commission) concurrent authority with the FERC over LNG siting decisions was withdrawn by the Senator and substituted with an amendment provision to give state governors veto power over LNG approvals by the FERC. However, the Senate defeated this amendment provision in late June. The U.S. House of Representatives bill (H.R. 6), which passed on April 21, 2005, entrusts the FERC with sole authority for the permitting of LNG facilities.

Harbor Commission

Q - Who appoints the Harbor Commissioners and what authority do they have in the LNG approval process? Any elected official on the Harbor Commission?
A- The Harbor Commissioners are appointed by the Long Beach City Council for up to two 6-year terms. There are no elected officials on the Harbor Commission.

Q- Is the Port of Long Beach considered a government agency?
A - The Harbor Commission is a quasi-governmental agency with exclusive jurisdiction over Port operations.

Q- What has been and is the Port of Long Beach's position on the use of LNG clean fuel and natural gas in Port operations?
A - The Port has taken no position of this issue to date. Richard Steinke, Executive Director of the Long Beach Harbor Department, stated at the April 2 Workshop that the Harbor Commission will wait until completion of the joint EIR/EIS and the Hazard Analysis before determining the appropriateness of granting a lease for this LNG facility.

The Harbor Department and SES, with the cooperation of two container terminals, have jointly started a pilot project to assess the feasibility of using LNG to fuel container terminal equipment, specifically, the yard tractors that move containers around inside the terminals. The program will deploy several vehicles in two terminals, one in Long Beach and one in Los Angeles. The program will assess the ability of the tractors to accomplish the work in actual terminal use; evaluate logistical issues involving fueling, maintenance, and training; and compare emissions of LNG tractors to conventional diesel-powered tractors. The LNG tractors, which are spark-ignited and require specialized fuel systems, have been special-ordered from the manufacturer and will be delivered in September 2005. The test program is scheduled for completion in the spring of 2006.

Q - What is the Port's/Harbor Commission's role in the LNG approval process?
A - This is in part dependent on the outcome of the Conference Committee in charge of resolving language differences in the recently passed House and Senate legislation. However, both House and Senate bills grant exclusive authority to the Federal Energy Regulatory Commission (FERC) over state or local agencies in the siting, construction, expansion and operation of LNG terminals.

At the June 7, 2005 Long Beach City Council meeting, City Attorney Robert Shannon opined that the language of any final federal legislation on LNG could

give the FERC exclusive jurisdiction over any state mechanisms, including the California Environmental Quality Act (CEQA).

At present, the Port is the Lead Agency under CEQA for the Environmental Impact Report (EIR) that is being prepared jointly with the Environmental Impact Statement (EIS) being prepared in accordance with federal environmental law under the National Environmental Protection Act (NEPA). The FERC is the Lead Agency under NEPA. A draft of this joint EIR/EIS is anticipated to be available for public review in the fall of 2005.

As landlord for the Port, the Harbor Commission has the legal authority to approve or deny any lease agreement for this LNG facility. Robert Kanter, Director of the Harbor Department Planning Division, stated at the April 2 Workshop that the Port is responsible for the following actions in this LNG process: preparation of environmental documents, preparation of the Port Master Plan Amendment, Harbor Commission project approval, issuance of a Preferential Area Assignment (lease), and issuance of a Harbor Development Permit to allow construction. To what extent the Port's current authority would be diminished or terminated upon final approval of the Energy Policy Act of 2005 by the President of the United States is at present unclear.

Q - How can Harbor Commissioners be removed from their positions?
A - All Harbor Commissioners are members of a City Charter-mandated Commission and appointed by the Long Beach City Council. Any Harbor Commissioner may be removed by the City Council in accordance with Section 510 of the City Charter, which states that the City Council may by a vote of a majority of its members remove any member of a Charter-mandated Commission at any time upon stating in writing, the reasons for such removal and allowing the member an opportunity to be heard by the City Council. Any member of a Charter-mandated Commission may be removed for incompetence, malfeasance, misfeasance, neglect, of duty or conviction of a crime involving moral turpitude.

Q - Can the 45 day public review period on the EIR/EIS be extended to allow adequate public comment?
A - The EIR/EIS (Environmental Impact Report/Environmental Impact Statement) is a joint environmental document in compliance with both the state California Environmental Quality Act (CEQA, which guides the EIR process) and federal National Environmental Policy Act (NEPA, which guides the EIS process). The Port is the Lead Agency in charge of the CEQA process and the FERC is the Lead Agency for NEPA.

A request for a longer review period could be made when the EIR/EIS has begun public circulation, which is anticipated to start in the fall of 2005. Since this is a joint document prepared under both NEPA and CEQA, any extension of the 45 day review period may need to be approved by both the Port and the FERC,

although the Port could possibly extend the CEQA review period even if the FERC decides not to extend the NEPA review period. Pending federal legislation may alter the Port's project authority under CEQA.

Long Beach City Council

Q - Since LNG is not a renewable energy resource, how does the City Council justify this project given the adopted 2010 Strategic Plan environmental goal of creating a Sustainable City Program?
A - The LNG facility would provide a stable source of natural gas with the potential for lower natural gas prices for Long Beach residents and businesses. This reflects the continuing demand in the City for natural gas as an energy source.

Goal E1 of the 2010 Strategic Plan includes Strategic Action E1.9, which directs the City to collaborate with the Air Quality Management District, the Regional Water Quality Control Board, and other agencies in regional efforts to reduce pollution. While natural gas is not a renewable energy source such as wind or solar power, it is considered the cleanest burning of all nonrenewable energy sources. Replacement of public and private diesel-powered vehicles with natural gas powered vehicles will reduce air pollutants without a long-term investment in new technology.

Q - Why can't we have an election on this matter? Can the City Council authorize a vote of the people?
A - Any local election must be in accordance with Article XIX of the Long Beach City Charter for special municipal elections, including an election to amend the City Charter or Article XX of the City Charter for initiatives and referendums.

ECONOMIC ISSUES

Natural Gas Prices

Q - Does the $3.00 domestic gas price used by Bill Powers include any costs for transportation, processing or marketing?
A - The price quote was intended to represent the cost to SES at the country of origin before factoring in any processing or transportation costs incurred by SES.

Q - Which is more expensive today, electricity generated by solar power or by natural gas?
A - That is dependent on several factors related to available supply and current demand. For more information on California energy costs, see the California Energy Commission's website at www.energy.ca.gov.

Natural Gas Suppliers

Q - What companies, and from what countries, will the LNG be obtained for this facility?
A - LNG exports could come from a number of countries, primarily located in the Pacific Rim. For more information on prospective suppliers, please contact Tom Giles of SES at www.soundenergysolutions.com.

Q - Next year oil prices could hit $105 per barrel. Has there been any studies done on the length of time before natural gas reaches peak demand/peak price?
A -. For more information on nationwide energy costs, see the U.S. Department of Energy website at www.energy.gov.

Local Economic Effects of LNG

Q - How would this LNG facility impact the local economy?
A -This facility would provide both employment opportunities and a substantial increase in local tax revenues. At the April 2, 2005 LNG Workshop, it was estimated by Lois Ledger, League of Women Voters, that this project would generate about 1.3 million in tax revenue to the City's general fund, nearly two million in lease payments to the Port, about 2.4 million in tariffs to Long Beach Energy, about 2.8 million in property tax revenues to the local school district and other special districts. However, these estimates (which come from the Los Angeles County Economic Development Corporation) have not been verified by the City for accuracy. The "Long Beach LNG Terminal Fact Sheet" provided by SES states that this facility will increase combined state and local government revenues by an estimated $6.1 million annually, with over $4 million injected directly to Long Beach.

How and to what extent would the announced changes in this project reduce the anticipated project benefits such as loss of trucking and product handling jobs?
A - Project production and local benefits will be addressed in the EIR/EIS. Also contact Tom Giles of SES at www.soundenergysolutions.com

Q -Could nearby homeowners within the zone of danger see increases or termination of their home, life, or health insurance policies due to LNG facility?
A - That would be a decision up to each individual insurance carrier. No information has been made available at this time indicating an insurance carrier has made a change in policies directly linked to LNG facilities.

Q - Would transportation of LNG shut down all other activities in the area, costing hundreds of lost work hours? Would it cripple Port activities? Would SES reimburse Port workers for any lost work hours?
A - The Port would not be shutdown due to regular LNG transportation activities. LNG vessels will be boarded by the Coast Guard outside of the breakwater without disrupting normal Port activities. A secure zone will be maintained around all LNG vessels entering and leaving the Port in the same manner as oil tankers. No delays to other Port activities are anticipated from this LNG terminal. Any potential reimbursement to Port workers from lost work hours would only be a possibility as the result of an LNG accident, and the extent of the accident and amount of lost work hours would determine any potential settlement.

Q - To what degree would other harbor traffic be slowed or shutdown by LNG vessels accessing Port?
A -The Port of Long Beach is a one-way channel, so no large vessels can pass each other in opposite directions. LNG vessels will be boarded by the Coast Guard outside of the breakwater without disrupting normal Port activities. A secure zone will be maintained around all LNG vessels entering and leaving the Port in the same manner as oil tankers.

Q - How would LNG surface transportation impact local traffic and freeways?
A - Surface transportation of natural gas will be no different than transportation of oil and gasoline via trucks.

How much of the LNG construction and operations be represented by union workers?
A - Union representation is a matter to be determined by the LNG applicant/operator. The construction of this facility is estimated to be 36 months with up to 1,000 workers. The SES representative, Tom Giles, stated at the April 2, 2005 LNG Workshop that these jobs would be for union workers. Project operation are anticipated to generate approximately 61 full-time jobs, including 28 truck drivers, and sustain up to 213 indirect jobs It has not been determined what the union representation would be for range of jobs created by project operations.

APPLICANT/PANEL ISSUES

SES Credibility

Q - Is SES a subsidiary of Haliburton? Is there any involvement from SES with the Maganmarona pipeline? What is human rights record of SES?
A - SES (Sound Energy Solutions) is a wholly-owned subsidiary of Mitsubishi Corporation. In May 2005, ConocoPhillips joined Mitsubishi as a co-owner of Sound Energy Solutions. The SES representative for the proposed Long Beach

facility is Tom Giles, who may be reached at (562) 495-9886 or at www.soundenergysolutions.com

Q - Why were the SES LNG demonstrations in their video presentation performed outdoors? Was this related to safety?
A - Please contact the SES representative, Tom Giles, who may be reached at (562) 495-9886 or at www.soundenergysolutions.com

Q - How does Tom Giles/SES intend to address all potential safety issues?
A - The proposed facility will be in full compliance with all applicable LNG safety and security regulations. This is an issue that will be fully discussed and analyzed in the EIR/EIS.

Q - Why does SES believe dependence on foreign natural gas will be a good thing?
A - Based on information provided by SES ("Long Beach LNG Terminal Fact Sheet"), Federal Reserve Chairman Alan Greenspan has called for an increase in LNG imports to avert a sustained rise in natural gas prices. This proposed facility would supply up to 20 percent of Southern California's natural gas requirements from abundant sources around the Pacific Rim, thereby potentially stabilizing prices.

Q - How will SES insure this project? In the event of a catastrophe, to what extent will SES corporate assets be committed as security?
A - Please contact the SES representative, Tom Giles, who may be reached at (562) 495-9886 or at www.soundenergysolutions.com

Project Construction Schedule

Q - How long before project could start?
A - Construction could not start until all required approvals and permits have been secured by the applicant. SES has estimated a 36 month construction period.

Audience Representation at April 2 Study Session

Q - How many audience members at this study session live or don't live in Long Beach.
A - It is not possible to determine the exact ratio of Long Beach resident/non-resident, since no sign-up sheets were circulated to audience members. However, based on audience participation, local residents appeared to be well represented in number.

Q - How many union people in the audience presently live in Long Beach?
A - No sign-up sheets were circulated to audience members, and therefore this representation cannot be accurately determined.

Panel Member Credentials

Q - Who does Bill Powers represent and is he being paid by any company or organization for his participation in this study session?
A - At the April 2, 2005 LNG Workshop, Bill Powers represented the "Border Power Plant Working Group," an organization allied with labor unions involved with energy projects in California, particularly in the San Diego area where Mr. Powers is based, to insure such projects are built by union labor to "the highest environmental standards." No compensation was offered by the City to any Workshop participant.

Presentation Request

Please e-mail copies of all visual presentations to chient@usc.edu